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ABSTRACT

TO PROVIDE INFORMATION ON EDUCATIONAL MODIFICATIONS FOR PHYSICALLY DISABLED CHILDREN, A REVIEW OF OVER 800 DOCUMENTS WAS EVALUATED, EXTENSIVE INTERVIEWS WERE CONDUCTED, AND CORRESPONDENCE WAS GATHERED. THE INFORMATION WAS COMPILED AND EVALUATED BY THE HUMAN RESOURCES CENTER AND PRESENTED IN FIVE MONOGRAPHS DEALING WITH SCHOOL DESIGN, EDUCATIONAL EQUIPMENT, TRANSPORTATION, STAFFING, AND CURRICULUM AND INSTRUCTIONAL TECHNIQUES FOR PHYSICALLY DISABLED STUDENTS. EACH DISCUSSION PRESENTS PROBLEMS AND SUGGESTS SOLUTIONS. THE CONCLUSIONS OF THE TOTAL PROJECT WERE THAT DISSEMINATION OF THIS COLLATED INFORMATION CAN RESULT IN BETTER EDUCATIONAL TECHNIQUES; THERE IS MUCH CREATIVE THINKING CURRENTLY, BUT LACK OF COMMUNICATION HAMPERS ADOPTION OF NEW TECHNIQUES; AND MORE SURVEYS OF INFORMATION ARE NEEDED CONCERNING INDIVIDUAL EXCEPTIONALITIES. SUMMARIES OF THE MONOGRAPHS ARE PROVIDED. (JM)

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FINAL REPORT
Project No. 5-0410-4-11-3
Grant No. 2644

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U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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SUMMARY

The goal of the present study was to provide information to persons concerned with the education of physically disabled children by describing and evaluating educational modifications for disabled children to insure that these children will receive an excellent education.

A number of methods were used in the collection of information. One method involved the review of literature relating to the education of physically disabled children. Over 800 books, articles, and pamphlets were reviewed and evaluated and a comprehensive bibliography was compiled. The literature review was supplemented by extensive interviews with personnel at special education centers, in conventional school systems, and with other individuals concerned with this area of education. These interviews, conducted throughout the country, indicated that there is much creative thinking going on, but that there is a tragic lack of communication among the various persons concerned with this attempt to provide quality education for disabled children. A third source of information was correspondence with individuals who could not be interviewed. Additional information was gathered at conventions and through the use of a team of professional consultants. Finally, much information was made available by the staff members of the Human Resources School.

All of the information gathered was compiled and evaluated by the staff at Human Resources. The results were organized and presented in a series of monographs. The titles of the monographs are:

Design of a School for Physically Disabled Students.
Educational and School Equipment for Physically Disabled Students.
The Transportation of Physically Disabled Students.
Staffing a School for Physically Disabled Students.
Curriculum and Instructional Techniques for Physically Disabled Students.

Each monograph contains a discussion of problems and suggests a solution or solutions to each problem. Frequently, there is a discussion of alternative viewpoints. There is also a summary and a comprehensive list of references.

The monographs will be made available to all persons concerned with the education of physically disabled students.

Based on the information compiled and the responses thereto, it is recommended that further projects of this type be initiated. There is a need for more monographs on new topics and for extended monographs on the topics already covered.

INTRODUCTION

The goal of "The Modification of Educational Equipment and Curricula for Maximum Utilization by Physically Disabled Students" is to provide information that will help to insure that physically disabled children receive an excellent education. The exclusion of intellectually normal, physically disabled students from regular school programs and their lack of full participation in the curriculum in many of those cases in which they are admitted to schools, indicated the need to demonstrate that many aspects of the educational process can be modified to allow for use by disabled children.

The purpose of the project was to describe and evaluate educational modifications for disabled children. More specifically, material was collected relating to modifications, the development of additional modifications was undertaken, and a series of monographs including detailed illustrative examples of such modifications has been printed.

The specific objectives of the project were:

1. To gather information from available sources regarding the adaptation of school facilities and equipment, teaching techniques, and course content to permit their maximum utilization by disabled children.

2. To develop new adaptations related to the areas discussed above.

3. To make available written materials summarizing the information gleaned in (1) and (2) above.

4. To demonstrate the techniques and procedures used in the Human Resources School.

5. To discuss the use of these modifications in local school settings and their application to normal educational procedures.

This project was unique in its provision for a central compilation of a wide range of modifications pertinent to the education of disabled children. At the present time there is no single summary of the creative thinking that has occurred in this field. The comprehensive information presented should help interested persons to provide these children with an excellent education. A secondary purpose was to stimulate educators to think about problems that arise in educating physically disabled children and to attempt to formulate their own solutions to these problems.

The need for this kind of information in special education has been expressed by everyone from the school superintendent and the local school board to the classroom teacher and the physical and occupational therapist. The information explosion has not yet reached into this area. While many persons have worked out ingenious solutions to problems that arise, these solutions have not been published. There is a lack of communication. Someone, somewhere has probably solved any given problem but few people know of the solution. Ultimately, the regional curriculum centers in special education will provide this information. In the interim, the present series of monographs has been designed to "spread the word."

The assumptions underlying the presentations in the monographs are:

A. Good education is defined in terms of external criteria, and is judged according to these criteria. The goal is the optimal education for each individual regardless of whether he is disabled or non-disabled.

B. It is desirable for disabled persons to attend integrated schools whenever possible.

C. Facilities and curricula should be planned for optimal use by all students.

D. Specific individual needs should be provided for to the extent possible within the confines of statement C.

E. Many of the special adaptations for disabled children can be used for non-disabled students as well.

It is realized that some of these assumptions are arguable, and their pros and cons are described in the monographs. Nevertheless, it is important that they be understood since they will enable those who read the monographs to discount some of the biases that appear throughout the series.

METHODS

Several methods were utilized to collect, develop, and ultimately to describe and demonstrate procedures designed to improve the education of disabled students. One method involved the compilation of existing materials through examination of the literature dealing with the various aspects of the problem. Over 800 books, articles, and pamphlets were reviewed and evaluated. A comprehensive bibliography was compiled, and each reference was indexed and cross-referenced on McBee cards.

The literature review was supplemented by extensive interviews with personnel at special education centers, conventional school systems, rehabilitation centers, workshops, and corporations producing educational equipment. Project personnel systematically interviewed leading educators and other professionals concerned with the education of physically disabled persons. The Appendix at the end of this report lists approximately 50 specialists visited by the principal investigator and project coordinator. Each of these persons provided a better understanding of some of the problems dealt with in the series of monographs. Geographically, these persons were concentrated in three areas; Southeastern United States, the West Coast, and the Central States. Thus, the project personnel were given the opportunity of learning about regional differences which might exist in special education programs for physically disabled students. Illustrations of the findings of these trips are provided in the monographs. These interviews provided us with useful information and insights. They clearly illustrated several of the points made in the introduction to this report: (1) there is a tragic lack of communication among persons concerned with the education of physically disabled children and, (2) many individuals have developed useful solutions to the various problems of concern to this undertaking. A great debt of gratitude is owed to all who were so cooperative in sharing the benefits of their experience with us. We learned much that could not be learned by a review of the literature. Unfortunately, it is much easier to cite references in the literature than to cite sources of in-

formation gained in extensive discussions. Consequently, the monographs contain ideas that came from these discussions that are inadequately documented. For this we apologize to our colleagues.

Third, information was obtained through correspondence with persons it was impossible to visit. This proved to be an important supplementary source of information and data. In many cases, our correspondents provided us with information that was too new to have been reported in the literature.

A fourth source of information was the material gathered at conventions and professional meetings throughout the United States. Members of the Human Resources staff attended conferences of the Council of Exceptional Children, the American Association of School Administrators, and various psychological associations. At these conferences a variety of published material was accumulated and contact was made with a number of specialists dealing with physically disabled persons. In addition, cooperation between the New York State Department of Education Bureau of Research and Hofstra University was maintained throughout this period to enable us to share our knowledge and jointly undertake a number of investigations in areas relevant to this project. The outcome of these cooperative ventures is reported in the monographs.

Finally, a small team of professional consultants was continuously available to the project personnel. These consultants were drawn from conventional education, special education, rehabilitation, and manufacturers of educational equipment.

The material compiled from these sources was organized and evaluated by the members of the staff at Human Resources. This was a cooperative venture in which many members of the Human Resources Center cooperated. Further, suggestions and ideas which had not been uncovered in any other manner were gained from the experience of the personnel of Human Resources School. A number of the modifications discussed in the monograph dealing with educational equipment are taken from this school where these modifications were utilized for the first time. The professional staff of Human Resources School contributed a great deal of time and shared their knowledge with us. Their contribution has been noted in the acknowledgment section of the monographs. While no attempt has been made to be comprehensive in discussing

every modification which has been successful according to our evaluation, illustrative examples of many of the modifications are provided. It is hoped that others working in the field of special education will now be stimulated to come up with their own solutions to the problems that they face.

RESULTS

The results of our experiences over the past two years are presented in a series of reports. Each report discusses a major aspect of the education of physically disabled students. The monographs have been designed to be used independently but it is suggested that the reader acquire the entire set for maximum information. The topics dealt with are:

Design of a School for Physically Disabled Students
Educational and School Equipment for Physically Disabled Students
The Transportation of Physically Disabled Students
Staffing a School for Physically Disabled Students
Curriculum and Instructional Techniques for Physically Disabled Students

The discussion of each topic includes a general introduction, a statement of problem areas, each with a solution or solutions, a summary and a list of references. The problems covered are those of greatest concern in the field; the ones most apt to arise when two persons concerned with the education of physically disabled children get together. The solution that is given is based on information obtained from the sources described previously. It represents our interpretation of the current thinking in the field today. When more than one solution is discussed, this is usually an indication either that there is disagreement among the experts or that the authors disagree with the experts. The reader is invited to evaluate each discussion and draw his own conclusions. The purpose of this series is as much to get people to think and to come up with their own solutions as it is to provide ready-made solutions.

The bibliography at the end of each monograph is, in some respects, the most important part of the series. It lists primary sources that provide the details that were omitted from the publications. In organizing this series a choice had to be made between breadth and depth. We decided to attempt to present a broad picture of the education of physically disabled children sacrificing depth of presentation in the process. Depth can be provided by use of the references.

Plans originally called for the description of modifications in two general categories; those that can be used effectively in conventional school programs, and those modifications which are limited to programs specially designed for physically disabled children. However, it was found in the course of the research that many modifications of the educational process have applications in both settings. Those cases in which modifications may be applicable to only one setting are specified in the monographs.

An idea of the results of this project may be gained by the summaries below of each of the monographs.

Design of a School for Physically Disabled Students

The primary considerations in the design of physical plant in a facility serving large numbers of disabled children or adults focus on four major principles. One is the range of movement available to most physically disabled people. This includes limitations in range of movement resulting from specific physical disabilities as well as those resulting from confinement in a prosthetic or orthotic device such as a wheelchair. These considerations influence the distances between objects and/or the height of placement. The second major consideration deals with the strength of the physically disabled subject. In general it can be assumed that physically disabled people have less physical strength than physically normal ones. As a result, design of certain units particularly those which move (e.g. doors) should include consideration of the weight involved and the nature of the movement required (e.g. push vs. pull). These considerations may be dealt with either through the material used in construction, or with mechanical devices such as hinges which can reduce the physical strength required for manipulation. Third, the dimensions of prosthetic devices, especially wheelchairs must be considered. This would include such factors as the turning radius of an individual chair, and number of wheelchairs likely to make use of the facility at any given time. Such considerations will influence the amount of space devoted to any particular sub-unit of the facility. Finally, due to the fact that many prosthetic devices including wheelchairs, braces, and crutches are made of hard materials, the design of an attractive as well as an efficient facility should consider that these devices may scratch or mar furniture, walls, and doors. As a result, provisions should be made to consider the use of materials that show minimum signs of wear and tear.

This report centers around the modifications necessary to provide for the mobility and safety of the disabled child in the school. A basic core of modifications which are neither very extensive nor extremely costly is described. The conclusion drawn is that the basic adaptations necessary to accommodate disabled students do not add to construction costs of the new building. The monograph includes a discussion of mobility problems; classroom layout; science laboratories; industrial and fine arts areas; the library; the cafeteria; sanitary facilities; closets and storage areas; recreational areas including playgrounds, gymnasium, auditorium and swimming pool; parking. Recommendations are made for the design of each and specifications and suggestions are provided dealing with the ideal solution versus the minimal solution.

It is pointed out that sound architectural planning can produce attractive, efficient, and economical physical facilities which may be used effectively by both physically disabled and normal persons. This monograph describes some modifications to existing structures and provides some general guidelines for the planning of new ones.

Educational and School Equipment for Physically Disabled Students

This monograph contains discussions of the various items of school equipment that serve as barriers to the proper education of disabled individuals. By careful thought and analysis, equipment can be selected that can be profitably used by disabled children. If suitable equipment is not commercially available, it may be necessary to modify the equipment, or, occasionally, even to prepare specially adapted, made-to-order equipment. In the selection and modification of equipment, instructional quality and effectiveness should be the prime consideration, with economy and maximum utility being important subsidiary concerns.

The first section of the monograph contains discussions of the furniture and equipment appropriate for use in schools where there are disabled children. The topics discussed include tables and desks, bookcases and storage cabinets, chalkboards, audio-visual aids, communication aids, and mobility and postural equipment. While there are specific points to be made with respect to some of these items, there are basic underlying considerations that apply to all of them. In selecting furniture and equipment for use by disabled persons, questions such as the following should be asked: 1) Is the equipment of an appropriate height, or can the height be adjusted? Be-

cause some disabled children are in wheelchairs and cannot stand up, the height of desks, shelves, cabinets, etc. are of primary importance. 2) Has provision been made for each student in the class to see what is going on with a minimum of moving about? The use of appropriate projection equipment, mirrors, and audio-visual aids can greatly facilitate communication with a minimum of student mobility being required. 3) Is the equipment arranged so that a student in a wheelchair can get to it? Chalkboards that are flush against the wall and tables that a person in a wheelchair cannot wheel under provide barriers. 4) Is there special equipment that the student can use at his desk that will make it possible for him to carry out his tasks? Equipment such as electric typewriters, tape recorders, or special chalkboards can often be used to facilitate the education of a child with limited physical capabilities. 5) Is the school concerned with making special equipment available to facilitate the student's mobility? Some schools provide wheelchairs, litters, etc. for their students while others require the students to provide their own mobility equipment.

The above considerations apply not only to the classrooms, but to the specific educational areas as well. Care must be taken to see that all areas, including the laboratories, library, cafeteria, auditorium, and gymnasium are suitably equipped. In each of these rooms consideration should be given to the height of the equipment and whether a wheelchair fits under it. In each case the items of equipment should be far enough from one another so that wheelchairs can move between them. There should be provision of audio-visual aids and overhead mirrors to facilitate vision from all parts of the room.

In some areas there are other specific requirements. The auditorium should not have steps either leading to it, or in it. There should be a ramp leading to the stage, and auditorium space should be provided for students to sit in their wheelchairs. The gymnasium should have the usual equipment since the current emphasis is on adapting the program of activities to the disabled individual rather than adapting the physical facilities per se. Despite this, some modified equipment can be used for those persons with limited strength and dexterity. Under ideal conditions, home economics rooms should provide two complete sets of equipment; one set that is completely unmodified, the other completely modified for optimum use by a person in a wheelchair.

These suggestions are intended to serve as guidelines for providing equipment for disabled students in schools. Many other ideas are presented in the literature, and productive thinking should always be used in any attempt to solve these problems.

The Transportation of Physically Disabled Students

In considering the transportation of disabled children to school the factors to be considered include type of vehicle used, the selection and training of drivers, the problem of time spent in travel, and the administration and financing of the operation.

Standard school buses are most satisfactory when they are used for transporting ambulatory or semi-ambulatory persons. Their advantages include their relatively low cost, ready availability, and large load capacity. However, they are not particularly useful for transporting severely disabled children, and can give rise to a number of problems. A school bus that has been adapted to provide a more efficient means of entrance and egress for disabled students and special safety features is much more satisfactory. The use of various types of lifts has been found to be an efficient means of facilitating the transportation of both students in wheelchairs and those who have difficulties in climbing into regular vehicles. Vans and compact buses can be readily adapted for transporting disabled students. They can be modified through the use of ramps or portable lifts. They are of limited capacity, however. Taxis appears to be quite suitable as a means of solving special transportation problems although quite costly, and outside vehicles such as the Checker cabs can be efficiently used. Finally, while standard automobiles and station wagons can be used, they usually prove to be not very satisfactory. The costs involved in using these several types of vehicles can vary greatly.

The selection, orientation, and training of the persons who drive the vehicles used by disabled students is of major importance. The drivers must meet several sets of qualifications and should be carefully trained. If volunteer drivers are used, it is important that they be required to meet the same qualifications as regular drivers, and that they be given the same training.

Problems may arise when disabled children spend much time traveling to and from school. When this is the case, attempts should be made to schedule the transportation in such a way as to minimize the time enroute. A second alternative is to attempt to make efficient use of the time.

Finally, problems of administration and financing have been discussed and several alternative procedures outlined. In general, these details will be dependent upon local and state rules and regulations.

Staffing a School for Physically Disabled Students

Staff needs in schools that educate disabled children are more complex than those in regular schools. Decisions have to be made concerning the types of personnel needed, the kinds of training that the personnel should have and the specific functions they are to perform. Decisions regarding these factors will usually vary from school to school and will be related to the size and type of school, the number of disabled children enrolled, and the types of disabilities that the children have.

While it can be argued that the teacher of disabled children should have training in special education, there is evidence that indicates that regular teachers can often be advantageously used. A competent teacher who is interested in working with and instructing disabled children will usually be quite effective in the classroom. On the other hand, a number of states and school districts have requirements that teachers of exceptional children have specialized formal training of one type or another. Whether or not the teacher has training in special education, it is important that some kind of inservice orientation be provided. Various types of orientation and training programs for the professional and non-professional staff are suggested. It is essential that teachers and staff members be provided with information about disabled children since the evidence indicates that the more information they have, the more apt people are to have appropriate attitudes and manifest appropriate behaviors toward persons with disabilities.

The special personnel needed in programs of special education will vary with a number of factors such as the size of the school or school district and its educational philosophy. Some school districts have a great many specialized coordinators and administrators, while others attempt to keep the number of special administrators to a minimum. Among the specialized personnel that may be used in the school are a medical director or a school physician, a school nurse, physical education teachers with specialized training, physical therapists, occupational therapists, speech therapists, reading specialists, recreation leaders, school psychologists, guidance counselors, and social workers. Obviously, many of these specialized personnel are found in schools for non-disabled as well as disabled children. When they operate

within the setting of a school that has disabled children, their functions are apt to be somewhat different from what they are in a setting that does not involve disabled children. For these specialized functions, some additional training is frequently required.

In addition to the personnel mentioned above, it is advantageous for a school to have non-teaching aides and attendants working with the children. These individuals can be very useful in helping the disabled child to move about the school, toileting, feeding, etc. They can also help the teacher with clerical work and supervisory duties, and take part in field trips and special projects.

All the states now make some financial provision for exceptional children, although not every state provides for every type of disability. In addition, the federal government has greatly increased its support of programs in special education. These programs help to meet the increased costs incurred in providing an adequate education for disabled children.

The team approach can be quite useful in the education of disabled children. It is important that the efforts of the various staff members be coordinated so that they can share and benefit from one another's knowledge and insight. It is often very helpful if the child's parents are considered part of the team and in one way or another be integrated into the team and made cognizant of the various problems and their solutions. Finally, there is evidence to indicate that the use of disabled staff members can be helpful in promoting appropriate attitudes.

Curriculum and Instructional Techniques for Physically Disabled Students

It has not been demonstrated that the intellectual ability of physically disabled children varies from that of the total school population. There is a paucity of data regarding cognitive and affective characteristics of physically disabled children, and some of the findings seem contradictory.

Foremost as an aim in the education of the physically disabled child is the development of latent resources, intellectual, social, and physical. Some special requirements in the education of the physically disabled child are the need for additional school time and an enriched curricula. Additional consideration must be given to

to aspects of instructional techniques, such as testing and the assignment of class and homework. Teacher aides are necessary adjuncts in the education of the physically disabled child. It is important to select teachers and ancillary personnel who are versatile, mature, and understanding individuals.

The pre-school program should provide each child with a background of educational experience to compensate for experiential deprivation and to prevent future learning problems.

The elementary program should be broadly based in subject areas, and should emphasize integration of knowledge in subject areas and foster development of emotional and social maturity.

The secondary curriculum for the physically disabled child should parallel traditional patterns of subject materials and instruction to a great degree. This is particularly true of those areas of learning which rely heavily upon the lecture-discussion approach. Modifications in curricula and instructional techniques are most prevalent in such areas as home economics, science laboratory, and physical education. The secondary curriculum should provide special courses of a pre-vocational nature for the physically disabled child, and a full program of driver education.

A fifth year program on the secondary level has also been suggested. Such a year of additional education might be spent exploring vocational possibilities firsthand. The specific suggestion is to allow the student to experience a full work day or several work days on a trial basis, to be followed by a day of seminar activity which would include an evaluation of the student as he relates to fellow workers and his superiors. This year of learning through direct experience would also include activities to expand the social and cultural life of the physically disabled student. The best placement of such a year would be between the traditional 11th and 12th year of the secondary curriculum. The implementation of such a program within a secondary school would be an important innovation in the education of the physically disabled child.

Throughout the school experiences of the disabled an attempt must be made to develop in him the greatest possible degree of psychological and physical independence. Only constant attention to these factors will enable him to begin to achieve economic self-sufficiency and personal fulfillment.

A mailing list of approximately 1,000 special educators, rehabilitation personnel, psychologists and physical and occupational therapists has been compiled as a result of requests for this information. In their requests, these individuals have emphasized the need for a central compilation of this type. One request suggested the possible adoption of these monographs as the course text in special education courses at the University of the City of Los Angeles. In addition, each of the individuals with whom we have corresponded as well as those with whom we have consulted, expressed their interest and the feeling that such a compilation of material is long overdue. Ultimately, of course, this dissemination function will be assumed by the regional curriculum centers in special education. In the interim, it is hoped that this series of publications will help fill a long unmet need.

It is hoped that one important function that these monographs will serve will be to stimulate others to come up with solutions to the various problems discussed. It is hoped, further, that these individuals will communicate with their colleagues and will make available the results of their own experimentation. In this respect, Human Resources Center would be most interested in receiving feedback from the many professionals who will be reading this series.

CONCLUSIONS

From the foregoing it can be seen that there is significant interest in the results of this project. The need for the monographs has been expressed by many. The plans for disseminating the results of this project call for its submission to the ERIC Clearinghouse of The Council for Exceptional Children and to the professional journals dealing with specific aspects of the education of physically disabled children. Presentations and papers delivered at professional meetings comparable to The Council for Exceptional Children meeting held in St. Louis in 1967 should be continued. In addition, these monographs will be available upon request, free of charge, to all interested persons. As previously stated, it is also hoped that information will be forthcoming from the users of these monographs; that they will provide their own evaluations of the solutions proposed and will develop additional solutions that have not been suggested in the series.

In general, then, the following conclusions may be drawn:

1. The research done for these monographs clearly indicates that it is possible for disabled children to receive a good quality education. Much of the information provided will help to guarantee that this is done.

2. The data indicate that there is much creative thinking going on in the area of the education of children with physical disabilities. There are many good innovations and suggestions that have been implemented by schools in various parts of the country.

3. One of the major problems in the field is a lack of communication among the various innovators. Very frequently persons at one school have no idea of what is being done even at neighboring schools, and they certainly do not know what is happening across the country. Occasionally, even colleagues within the same educational system will not be aware of what is being done in other parts of the system.

4. Because of this there is a great need for the type of information presented. The series of monographs was designed to present some specific information, and also to get people to think both of the problems and the possible solutions to the problems.

5. The present report can only scratch the surface and provide some indication of what has been done and what can be done. It was not possible to provide a comprehensive report in the time span provided. Furthermore, it should be pointed out that much of the material contained in the report is already somewhat outdated since new innovations and new suggestions are continually being made.

Using the professional feedback from this series of monographs, which may be considered a general introduction to, and a broad overview of, the field of special education as it relates to physically disabled children, a series of studies may be undertaken at Human Resources School which will provide in-depth investigation and analysis or evaluation of some of the many topics covered in the monographs. For example, while the monograph dealing with curriculum and instructional techniques presents an overview of a physical education and home economics curriculum for physically disabled students, a monograph may be initiated which will provide a step-by-step, technique-by-technique, grade-by-grade list of recommendations and

suggestions. The curriculum covered in such a monograph may range from pre-school through high school levels.

RECOMMENDATIONS

In view of the above conclusions, we should like to make the following recommendations:

A. Since the present series of monographs was somewhat limited in scope it is recommended that further research be commissioned to deal with other related topics. Among the topics that might be covered are the following:

1. Utilization of audio visual aids for physically disabled students.

2. The efficacy of instructional television and computer assisted instruction in the education of physically disabled students.

3. Development of curricula in pre-vocational and vocational training in such areas as banking, data processing, and electronics for physically disabled students.

4. Development of curricula for courses in physiology and psychology at the high school level for physically disabled students. Such courses may include the physical and psychological problems of disability, sex education, hygiene, etc.

5. Development of a course for the training of teaching aides to help overcome the severe teacher shortage in special education.

6. Development of a comprehensive driver's education course, a course in study skills, and core curricula in the humanities and sciences.

7. Development of architectural guides for a special physical educational gymnasium and for outdoor recreation areas for severely disabled persons.

8. The elaboration and development of self-help devices for physically disabled students.

B. An attempt should be made to provide more extended discussions of the topics of these monographs. The monographs should be expanded so that they would be more useful. It might be possible to present comprehensive monographs dealing with what are sub-sections of the present monographs.

In light of the above, this series of monographs is just a beginning, a starting point in the development of a comprehensive series of curriculum and technique advances in the education of the physically disabled. It seems to us that there is a great need for the kind of follow up described above to insure that the field of special education not stagnate. With thoughtful planning and investigation this goal can be achieved.

REFERENCES

A full list of all the bibliographic sources used is found in the reference section of each monograph.

APPENDIX

The authors would like to express their gratitude to the many persons who generously contributed their time and shared their knowledge. Each of the individuals listed below, provided a better understanding of some of the many problems dealt with in this series of monographs through consultations and interviews. Our appreciation is also extended to the many persons with whom we have corresponded and from whom we learned a great deal. Ultimately, of course, the opinions presented are those of the authors who take full responsibility for them.

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